

Green Completions



Partner Reported Opportunities (PROs)
for Reducing Methane Emissions

PRO Fact Sheet No. 703

Applicable sector(s):

☒ Production ☐ Processing ☐ Transmission and Distribution

Partners reporting this PRO: BP, ConocoPhillips Company

Other related PROs: Install Downhole Separator Pumps, Connect Casing to VRU, Install Compressors to Capture Casinghead Gas

Compressors/Engines ☐
Dehydrators ☐
Pipelines ☐
Pneumatics/Controls ☐
Tanks ☐
Valves ☐
Wells ☒
Other ☐

Technology/Practice Overview

Description

When gas wells are drilled, a final step before producing the natural gas to a sales line is to “clean-up” the well-bore and reservoir immediately surrounding the well. Traditionally this well completion step involves producing the well to open pits or tankage where sand, cuttings, and reservoir fluids are collected for disposal and the produced natural gas is vented to the atmosphere.

Partners reported using a “green completion” method in which equipment is brought on site to clean up the gas sufficiently for delivery to sales. The additional equipment may include considerably more tankage, special gas-liquid-sand separator traps, and portable gas dehydration. In addition to reducing methane emissions, green completions produce an immediate revenue stream with the produced natural gas and gas liquids, less solid waste and water pollution, and a safer operating practice.

Operating Requirements

Sales line connection and sales agreements need to be arranged before the well drilling is completed.

Applicability

This applies to the drilling of all natural gas wells.

Methane Savings: 7,000 Mcf per year

Costs

Capital Costs (including installation)

☐ <\$1,000 ☒ \$1,000 – \$10,000 ☐ >\$10,000

Operating and Maintenance Costs (annual)

☐ <\$100 ☐ \$100-\$1,000 ☒ >\$1,000

Payback (Years)

☐ 0–1 ☒ 1–3 ☐ 3–10 ☐ >10

Benefits

Reducing methane emissions was the primary benefit of the project.

Methane Emissions Reductions

The methane emissions reduction is estimated as the total recovered from 63 wells reported by a partner. This partner reported natural gas emissions reduction of 7,410 Mcf per year, which is 70 percent of the gas formerly vented to the atmosphere.

Economic Analysis

Basis for Costs and Savings

Methane savings of 7,000 Mcf per year are based on completing 60 wells per year at the average recovery reported by the partner. The partner also reported recovering a total of 156 barrels of condensate from the 63 wells, an average of 2.5 barrels per well.

Discussion

The capital cost includes additional portable separators, sand traps, and tanks at a cost reported by the partner of \$180,000. This equipment would be moved from well-to-well, so amortizing the cost over 10 years and doing 60 wells per year, the annual capital charges would be under \$10,000. Incremental operating costs are assumed to be over \$1,000 per year. At a natural gas price of \$3 per Mcf and condensate price of \$19 per barrel, green completions will pay back the costs in about 1 year.